

University of Groningen

**Target population's requirements on a community-based intervention for stimulating physical activity in hard-to-reach physically disabled people**

Krops, Leonie A; Folkertsma, Nienke; Hols, Doortje H J; Geertzen, Jan H B; Dijkstra, Pieter U; Dekker, Rienk

*Published in:*  
Disability and Rehabilitation

*DOI:*  
[10.1080/09638288.2018.1462411](https://doi.org/10.1080/09638288.2018.1462411)

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2019

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Krops, L. A., Folkertsma, N., Hols, D. H. J., Geertzen, J. H. B., Dijkstra, P. U., & Dekker, R. (2019). Target population's requirements on a community-based intervention for stimulating physical activity in hard-to-reach physically disabled people: an interview study. *Disability and Rehabilitation*, 41(19), 2272-2279. <https://doi.org/10.1080/09638288.2018.1462411>

**Copyright**

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

**Take-down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.



## Target population's requirements on a community-based intervention for stimulating physical activity in hard-to-reach physically disabled people: an interview study

Leonie A. Krops, Nienke Folkertsma, Doortje H. J. Hols, Jan H. B. Geertzen, Pieter U. Dijkstra & Rienk Dekker

To cite this article: Leonie A. Krops, Nienke Folkertsma, Doortje H. J. Hols, Jan H. B. Geertzen, Pieter U. Dijkstra & Rienk Dekker (2018): Target population's requirements on a community-based intervention for stimulating physical activity in hard-to-reach physically disabled people: an interview study, *Disability and Rehabilitation*, DOI: [10.1080/09638288.2018.1462411](https://doi.org/10.1080/09638288.2018.1462411)

To link to this article: <https://doi.org/10.1080/09638288.2018.1462411>



© 2018 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 31 May 2018.



Submit your article to this journal [↗](#)



Article views: 148




View Crossmark data [↗](#)

ORIGINAL ARTICLE



## Target population's requirements on a community-based intervention for stimulating physical activity in hard-to-reach physically disabled people: an interview study

Leonie A. Krops<sup>a</sup> , Nienke Folkertsma<sup>b</sup>, Doortje H. J. Hols<sup>b</sup>, Jan H. B. Geertzen<sup>a</sup>, Pieter U. Dijkstra<sup>a,c</sup> and Rienk Dekker<sup>a,d</sup>

<sup>a</sup>Department of Rehabilitation Medicine, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands; <sup>b</sup>Center for Human Movement Sciences, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands; <sup>c</sup>Department of Oral and Maxillofacial Surgery, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands; <sup>d</sup>Center of Sports Medicine, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands

### ABSTRACT

**Purpose:** To explore ideas of the target population about a community-based intervention to stimulate physical activity in hard-to-reach physically disabled people.

**Materials and methods:** Semi-structured interviews were performed with 21 physically disabled people, and analyzed using thematic analyses. Findings were interpreted using the integrated Physical Activity for People with a Disability and Intervention Mapping model.

**Results:** The intervention should aim to stimulate intrinsic motivation and raise awareness for the health effects of physical activity. It should provide diverse activities, increase visibility of these activities, and improve image of physical activity for physically disabled people. Participants suggested to provide individual coaching sessions, increase marketing, present role models, and assign buddies. Potential users should be approached personally through intermediate organizations, or via social media and word of mouth promotion. Participants suggested that users, government, sponsors, and health insurers should finance the intervention. Self-responsibility for being physically active was strongly emphasized by participants.

**Conclusions:** An intervention to stimulate physical activity in hard-to-reach physically disabled people should be individualized, include personal support, and should include marketing to improve image of physical activity of physically disabled people. The intervention that fulfills these requirements should be developed and tested for effects in future research.

### ARTICLE HISTORY

Received 26 October 2017

Revised 3 April 2018

Accepted 4 April 2018

### KEYWORDS

Physical activity behavior; disability; rehabilitation; co-creation; personal coaching

### ► IMPLICATIONS FOR REHABILITATION

- An intervention to stimulate physical activity in physically disabled people should aim to raise awareness for the health effects of physical activity, stimulate intrinsic motivation, offer diverse activities, increase the visibility of the possible activities, and improve the image of physical activity for physically disabled people.
- An intervention should include both individual- and environmental-level intervention methods. Physically disabled people most emphasized individual-level characteristics of an intervention.
- For intervention development, professionals should take into account that physically disabled people believe that being physically active is a person's own responsibility.



## Introduction

As described by the International Classification of Functioning model, activities and participation are important aspects of human functioning [1]. A recent meta-analysis including data of over one million able-bodied people showed that participating about 60–75 min per day in moderate intensity physical activity can eliminate the increased risk of death associated with high sitting time [2]. Throughout the current study, physical activity is defined as any bodily movement produced by skeletal muscles that requires energy expenditure [3]. Participation in physical activity benefits health and functioning not only in able-bodied people, but also in

physically disabled people [4,5]. Physically disabled people participate substantially less in physical activity compared to able-bodied people, because of several personal and environmental barriers related to their disability [5,6].

Scientific interest for physical activity participation in physically disabled people has increased only the past 20 years [7]. Currently, research shifts from describing barriers and facilitators of being physically active to develop interventions to stimulate physical activity in disabled people [8].

From a behavioral science perspective, physical activity in disabled people can be described by the Physical Activity for people with a Disability (PAD) model [9]. The PAD model is composed

**CONTACT** Leonie A. Krops  [l.a.krops@umcg.nl](mailto:l.a.krops@umcg.nl)  Department of Rehabilitation Medicine, University of Groningen, University Medical Center Groningen, Hanzeplein 1, CB 41, PO Box 30.001, 9700 RB Groningen, The Netherlands

© 2018 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

from the International Classification of Functioning model [1] and the Attitude, Social influence, and Self-efficacy model [10], and describes how personal and environmental factors influence intention, and how intention leads to participation in physical activity [9]. For the systematic development of health promoting interventions, the stepwise method of Intervention Mapping (IM) can be used as a guideline [11]. The current study focusses on selecting theory-based intervention methods, and practical strategies (IM steps 2 and 3). In one of our earlier studies, the PAD model and the logic model of change of IM were integrated in order to describe both an intervention that stimulates physical activity and the physical activity behavior itself [12].

Internationally, more than 80 exercise interventions to stimulate physical activity in physically disabled people are described in literature, of which seven were not diagnosis specific [13,14]. Exercise was defined as a subset of physical activity that is planned, structured, and repetitive with the intent of improving or maintaining one or more facets of physical fitness or functioning [3]. To induce a long-term behavioral change, lifestyle physical activity interventions are preferred rather than exercise interventions [15]. Existing literature describes different physical activity stimulating interventions both in the Netherlands and internationally [16–24]. However, these existing physical activity stimulating interventions were either diagnosis specific [18–23], or offered through primary health care, special education, or rehabilitation [17,21,24], but the majority of the target population is not reached [16]. A community-based intervention, which also targets hard-to-reach physically disabled people (who cannot be reached by primary health care, special education, or rehabilitation) is required to reach the entire spectrum of physically disabled people.

Two systematic reviews on physical activity stimulating interventions for disabled people describe that there is a critical need for the development and determination of effectiveness of physical activity interventions for people with disabilities [13,14]. In the Netherlands, an existing intervention focusses on patients during and the first year after inpatient rehabilitation [24]. To prevent overlap with this existing intervention, this study focusses on physically disabled people who are longer than 1 year post rehabilitation, or not treated in a rehabilitation center.

In one of our earlier studies, existing literature describes professionals' ideas on stimulating physical activity in hard-to-reach physically disabled people [12,25]. Professionals expressed need to adapt an existing intervention and improve collaboration between organizations, instead of creating a new intervention. According to the professionals, an intervention should aim to change participants and environmental attitude towards physical activity through for instance individual coaching, feedback, trial periods, role models, and marketing campaigns [12]. However, to meet the needs, desires, and capabilities of the target population, involving the target population in developing physical activity stimulating interventions is important [26–28]. No studies were found involving the target population in the early development stages of a community-based physical activity stimulating intervention for physically disabled people. In order to consider both target population's and professionals' views, this study aims to explore ideas of the target population about a community-based intervention to stimulate physical activity in hard-to-reach physically disabled people.

## Methods

### Study design

A qualitative semi-structured interview study was conducted into ideas regarding a community-based physical activity intervention

in physically disabled people. In this early intervention planning phase, the use of qualitative research is recommended to investigate the attitudes, needs, and situation of the target group to select the most feasible intervention components for them [29]. Interviews were preferred, since qualitative research is inductive, and therefore more suitable for exploration research [30]. Because of the heterogeneity of diagnoses involved that might hamper verbal expression, individual interviews were preferred to ensure that each participant had the time and confidence to speak at ease. The Medical Ethical Committee of the University Medical Center Groningen, the Netherlands, confirmed that formal ethical approval was not required for this study (METc 2015/494).

### Participants

Potential participants were sampled purposively from the patient records (2012–2014) of the Center for Rehabilitation, University Medical Center Groningen, the Netherlands. A maximum variation sampling strategy was chosen to ensure that a wide range of different ideas were investigated in order to develop an intervention that matches the ideas of the heterogeneous target population. First, two patients were selected from the patient records from each diagnoses group (amputation, chronic pain, stroke, multiple sclerosis, neuromuscular disease, and spinal cord injury) by L.K., aiming at maximum variation of gender, age, and living situation (urban or rural). Patient information was checked for the inclusion and exclusion criteria written below. When patients did not meet the criteria, a new patient was selected from the patient records. Potential participants were included when they were older than 18 years, had a physical disability or chronic disease that impairs movement, and completed their inpatient rehabilitation for at least 1 year, or have not been treated in a rehabilitation center. Potential participants were excluded when they had severe mental problems, insufficient cognitive abilities to participate, insufficient understanding of the Dutch language, or a rapidly progressive or terminal condition. Former patients from the Center for Rehabilitation were contacted through phone by their rehabilitation physician, after which a letter of invitation was sent including more detailed information. In the first interviews, participants were not active, and were not experienced with interventions, making it hard to come up with requirements for an intervention. Therefore, more active participants were recruited from a sports group associated with the Center for Rehabilitation, and another regional sports club for physically disabled people. These participants were personally contacted during a training by the authors (N.F. and D.H.), after which the information letter was provided. By responding the information letter, potential participants declared their intention to participate. New participants were included until no new themes were obtained, which was after 15 interviews. Additionally, seven interviews were performed to ensure data saturation.

### Data collection

From January to March 2016, semi-structured interviews were conducted by the authors (N.F. and D.H.). Seventeen interviews were conducted by N.F. and D.H., three interviews were conducted by N.F. alone, and two by D.H. alone. Participants were interviewed in random order. For the interviews, a topic list was used with the following items: implications of the disability, attitude toward physical activity, ideas on a community-based movement intervention, ways how to reach and approach the target population, finance for the intervention and further recommendations. Open-ended questions were asked to encourage participants to share

Table 1. Characteristics of the participants.

Participant	Age (years)	Gender	Diagnosis	Physical activities	Interview location	Assistance	Inpatient rehabilitation <sup>a</sup>
1	55	Male	Paraplegia	Wheelchair tennis	Home		Yes
2	24	Female	Neuromuscular disease	–	Home	Father	No
3	69	Male	Transfemoral amputation	Physiotherapy	Home	Wife	Yes
4	35	Male	Neuromuscular disease	–	Home		No
5	63	Female	Cerebral vascular accident	Elderly gymnastics	Home		Yes
6	51	Male	Chronic back pain	Fitness	Home		No
7	68	Female	Multiple sclerosis	Cycling (home trainer)	Home	Husband	Yes
8	61	Male	Cardiopulmonary disease	Fitness	Rehabilitation center		Yes
9	33	Male	Transtibial amputation	Wheelchair basketball	Home	Wife	Yes
10	62	Male	Chronic fatigue syndrome	Sports group (various activities)	Home		Yes
11	33	Female	Cerebral vascular accident	Sports group (various activities)	Home		Yes
12	43	Female	Artificial knee	Cycling	Sports location		No
13	52	Female	Chronic knee injury	Sit volleyball	Sports location		No
14	63	Female	Chronic back pain	Swimming	Sports location		No
15	73	Female	Chronic hip/knee injury	Swimming	Sports location		No
16	61	Male	Artificial knee	Sit volleyball	Sports location		No
17	52	Female	Chronic hip injury	Sit volleyball	Sports location		No
18	22	Female	Complex regional pain syndrome	Sit volleyball	Sports location		No
19	48	Female	Cerebral palsy	Swimming	Rehabilitation center	Nurse	Yes
20	46	Male	Unclear diagnosis	Swimming	Sports location		No
21	51	Male	Balance disorder (unclear)	Swimming	Sports location		Yes

<sup>a</sup>Participants with a history of inpatient rehabilitation, underwent their inpatient rehabilitation at least 3 years ago.

their own experiences and ideas. Examples of questions are: how could we reach and approach hard-to-reach physically disabled people, who cannot be reached by primary health care, special education or rehabilitation? and: who should finance a physical activity stimulating intervention for physically disabled people? The topic list was based on the PAD model (implications of the disability, and attitude toward physical activity), step 4 of the IM protocol in which intervention methods and practical applications are determined (ideas on a community-based movement intervention) [11] and the Reach Effectiveness Adoption Implementation Maintenance (RE-AIM) framework for testing the implementation process of health promotion interventions (reach and approach of the target population, and finance for an intervention) [31]. The topic list was tested in two pilot interviews with persons without physical disability, and remained unchanged. Interviews were performed during personal meetings and lasted 10–62 min (mean: 27 min). To ensure that participants could speak at ease, most interviews were performed at home. However, for practical reasons, nine interviews were performed at the sports accommodation (Table 1). After being informed that participation was voluntary and data would be processed anonymously, participants gave their written informed consent and agreed with audio recording the interviews. To reduce bias and ensure validity every participant received a summary of the individual interview for member-checking by post. Participants were asked to indicate incorrect interpretations by returning the reaction form. Nonresponse within 2 months was assumed as a correct interpretation. One participant requested to leave out disease specific information, based on the member check.

### Data analysis

The audio recordings were transcribed verbatim (N.F. and D.H.). The transcripts were analyzed using an inductive latent thematic analysis, which is recommended for applied research [32,33]. The coding process of thematic analysis can be divided into open coding, axial coding, and selective coding, and consists of six phases [33]. First, N.F. and D.H. read all interviews again (phase 1: familiarizing with data). The first four interviews were open-coded by N.F. and D.H. independently (phase 2: generating initial codes). The codes obtained from the first four transcripts were discussed by three researchers (L.K., N.F., and D.H.), and clustered into subthemes (axial

coding) creating a coding tree (phase 3: searching for themes). Using this preliminary coding tree, the transcripts were coded by one of the authors (N.F. or D.H.) using Atlas.ti 7.5.10 (GmbH, Berlin, Germany). New emerging codes were added to the coding tree when necessary (phase 4: reviewing themes). For the last coding phase (selective coding), a more deductive approach was chosen, in which all subthemes, as found during the axial coding process, were inserted into the integrated Physical Activity for people with a Disability - Intervention Mapping (PAD-IM) model (phase 5: defining and naming themes) [12]. For data interpretation, summaries were made for each subtheme in which the general view and deviant views were described. These summaries formed the basis for the report (phase 6: producing report). To ensure consistency in coding, N.F. and D.H. constantly discussed the coding, and final coding was checked by the first author. Subthemes and final interpretation were discussed with all coauthors.

### Results

In total 22 physically disabled people participated (Table 1), of whom one was excluded due to unexpectedly insufficient cognitive abilities. In five interviews, a partner or nurse assisted the participant. Assistance varied from complementing answers to help with speech-related issues.

Figure 1 summarizes the results of the interviews within the integrated PAD-IM model [12]. In order to describe opportunities for approaching the target group and financing physical activity, approach of the target group and finance for an intervention are inserted as “conditions” at the bottom of the model. The results are described following the model from top to bottom. Throughout the results section, major themes that are mentioned in the model are printed in *italic*.

### Determinants of physical activity

The level of physical activity functioning is influenced by determinants of physical activity, which can be subdivided into personal and environmental factors [9]. Participants indicated *fun*, *health benefits*, *relaxation*, and *competition* to stimulate them to participate in physical activity. *Fun* was considered as the most important facilitator by most participants. Furthermore, *health benefits* including mental health, weight management, increasing



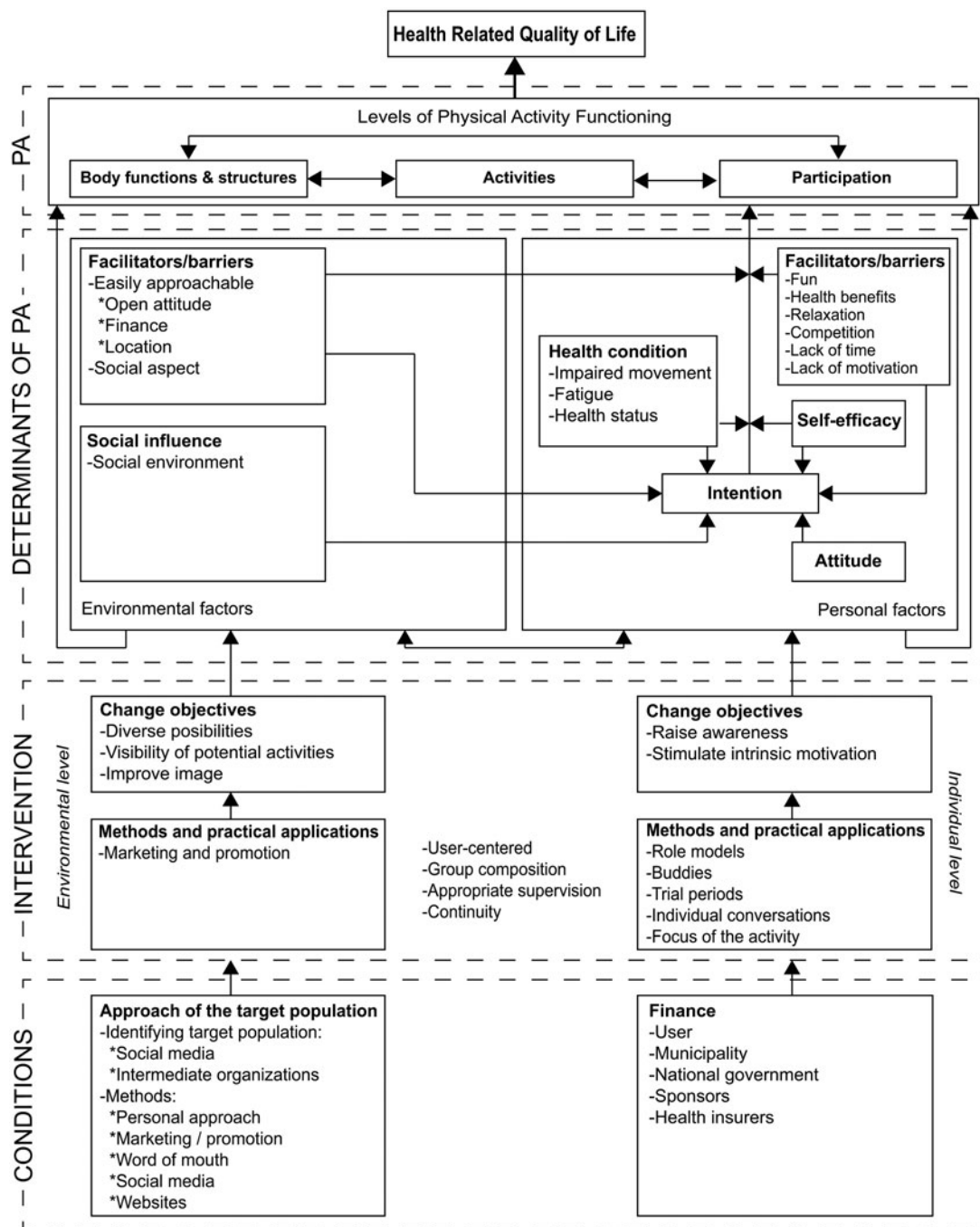


Figure 1. Themes resulting from the interviews summarized in the integrated PAD-IM model. The final model is composed from the PAD model ("PA" and "Determinants of PA"), logic model of change of IM ("Intervention"), and findings of the current study ("Conditions"). The order does not impose any sequence of importance. PA: physical activity.

cardiorespiratory fitness and muscle force were also often mentioned to facilitate physical activity participation.

I experienced that when you are more active, having a lower limb prosthesis, keeping up your leg muscle mass, your balance and stability are way better than when you are inactive. (Subject 9, lower limb amputation)

Participants indicated *lack of time* and *lack of motivation* as barriers for participating in physical activity. Moreover, they indicated that lower health condition, which includes *impaired movement*, *fatigue*, and lower general *health status* hampers participation in physical activity. Participants indicated that they experience fear of falling, reduced muscle power and fatigue, what keeps them from becoming active.

According to the participants, activities that are *easily approachable* and include a *social aspect* facilitate physical activity participation. Activities that are *easily approachable* have an *open attitude* toward new members, whereby they feel welcome to join the activity. Furthermore, *finance* (the activity should be as cheap as possible so that finance will not be a barrier) and *location* are elements of approachability. The location should be not too far away from where the person lives, and should have facilities as a lift and an adapted dressing room. *Social aspects* of in particular group activities are considered stimulating to participate in physical activity. Support from *social environment*, in particular family, stimulates people to become physically active. Some active participants mentioned that they would not have become physically

active without the support of their family. Therefore, some participants indicated that social environment should be involved in the intervention, for instance, by participating in activities.

Many people do not know how it feels (...). So we (physically active disabled people) should invite parents or family members to join and experience. (Subject 17, chronic hip injury)

### Intervention

According to the participants, at the level of the individual, the intervention should aim to *raise awareness* on the importance of being active, and that being active does not harm one's health. Participants hold the National Sports Federation, sports and patient associations and physicians responsible for emphasizing the importance of physical activity.

I think it is important to explain very clearly that moving does not harm, because I know that many people do believe it does. (Subject 14, chronic pain)

Moreover, the intervention should aim to *stimulate intrinsic motivation* since participants indicated that intrinsically motivated people are more likely to continue a physically active lifestyle compared to people that are not. Participants indicated that being physically active is the person's own responsibility.

*Role models, buddies, trial periods, individual conversations, and focus of the activity* were suggested as methods for accomplishing these intervention aims. *Role models*, either professional athletes or nonprofessional disabled people, active in a club in the region, can be used to intrinsically motivate people. *Buddies* who are members of a club that can contact and accompany the potential member during the first week can lower the barrier to contact a club.

Maybe it is not feasible, but you should link people. Suppose there is someone (...) who has to swim. Call us and say; (...) can you please contact that person? And that will maybe convince them. (Subject 14, chronic pain)

*Trial periods* can be used for both raising awareness and stimulating intrinsic motivation, since people can experience what being physically active can offer them. *Individual conversations* by a coach (e.g., a psychologist) were suggested for increasing intrinsic motivation. According to the participants, these conversations should focus on determining facilitators and barriers for the specific person to stimulate the facilitators and provide ways to encounter the barriers. According to the participants, *focus of the activity* should be on improving cardiorespiratory fitness and confidence in persons own abilities. Further, the intensity of activities should be gradually increased to improve endurance capacity and self-confidence.

According to the participants, at the environmental level the intervention should aim to offer *diverse possibilities* for physical activity, and increase the *visibility of potential activities*.

And where it is located, (...) I do not know what kind of sports there are for impaired people. (Subject 17, chronic hip injury)

Particularly, the suitability of diverse activities for specific patient groups should be made visible, since the interviewed participants experienced that patients tend to think that they are not able to perform many activities. Furthermore, the intervention should aim to *improve image* of adapted physical activity. Participants suggested attracting *marketing and promotion* as methods to accomplish these intervention aims. Media attention can *improve image* of adapted physical activity and show which activities are suitable for which patient groups. Participants suggested that personal experiences of disabled people, already active, should form the base of a marketing campaign. Moreover,

demonstrations, in which people can eventually participate, were mentioned as a form of *marketing and promotion*.

Furthermore, participants indicated that an intervention should be *user-centred*, implicating that the program should be adjusted to the individual. The impairment should be taken into account in both deciding the activity as in decisions within the activity, for instance the intensity. Participants had a heterogeneous opinion regarding *group composition*. Some participants preferred integrating in nondisability physical activity groups, since this increases understanding from able-bodied people. However, a slight majority of the participants preferred groups specifically for disabled people, since experiences can be shared and people can better empathize with each other. Some participants suggested that groups should be composed of people from the same age because of the shared physical capacity and perceptions, while others enjoy the diversity of the group regarding age. Most participants indicated that groups can be composed of people with different diagnoses; however, some participants mentioned it to be inconvenient in one group with people with intellectual disabilities. Most participants emphasized the importance of groups with the same functional level.

She speaks more at ease with twenty impaired people than with six bodybuilders. (Father of subject 2, neuromuscular disease)

Participants indicated the importance of *appropriate supervision*. Participants suggested that trainers and coaches should be experienced in working with the target group, and could be, for instance, a physiotherapist. However, one participant mentioned that a trainer does not have to be experienced, as long as the trainer is enthusiastic. Lastly, *continuity* in supervision was mentioned as an important factor. Almost, all participants indicated that they would benefit from a better referral from health care to organizations providing physical activity.

### Conditions

A section conditions was added to the model (Figure 1), which describes the approach of the target population and ways to finance physical activity. The approach can be divided into *identifying the target population*, and *methods* for approaching people. For identifying the target population, participants suggested *social media* and *intermediate organizations*. On *social media*, there are pages and groups special for people with specific disabilities. The participants suggested several *intermediate organizations* as for instance patient organizations and health care organizations, as hospitals, rehabilitation centers and physiotherapists to be in contact with the target population.

At first you need the people who refer patients, so professionals. (Subject 13, chronic knee injury)

The participants indicated *personal approach, marketing/promotion, word of mouth, social media, and websites* as methods to approach the target population. All participants suggested that personally approaching people by health care professionals or sports clubs would be most effective. One person mentioned that it is effective to contact people repeatedly, like commercial organizations do. However, he indicated that a *personal approach* is time intensive, hampering feasibility. Most of the participants who were physically active came in contact with the sports club by means of *word of mouth* via family, friends, and fellow citizens. Moreover, *websites* and *social media* were suggested for approaching the target population. Participants highlighted that the advantage of *social media* above *websites* is that it allows for directed marketing, by the use of groups special for specific impairments,

while the information on *websites* will be only read when people are actively searching themselves.

A website is the same as placing leaflets in a cabinet. When you are not drawing attention they are not going to look on your website. When I am not looking for wheelchair sports (...), I do not find it. (Subject 20, unclear diagnosis)

Participants indicated the *user*, *municipality*, *national government*, *sponsors*, and *health insurers* as parties that should finance physical activity. Most of the participants who were physically active financed themselves. In general, they agreed on that, since nondisabled people also have to finance their own activities. Some participants indicated that people feel more responsible for their activities when they finance the activities themselves.

I think you may finance physical activity yourself, because then involvement will be created (...). Because when everything will be financed people are more likely to cancel the activity, I think. (Subject 11, cerebral vascular accident)

When adapted transport is required to enable a disabled person to participate in physical activity, this will be reimbursed by a transport subsidy from the *municipality*. It was suggested that disabled people do have higher costs, combined with mostly a lower income; therefore, activities should be not too expensive. Some participants suggested that finance should be income dependent, in which the *municipality* partly compensates the costs of activities when people are not able to pay it themselves. Participants suggested *municipality* to be responsible for financing physical activity because medical devices are also reimbursed by *municipality*. Some municipalities do have subsidies for partial reimbursing physical activity in people with lower incomes. One of the participants indicated that *municipality* instead of *national government* should finance physical activity because of the decentralization of health care in the Netherlands. However, another participant indicated that *national government* should finance physical activity, because physically active people do need less home care, which saves *national government* money.

The national government should pay the rest, because if your fitness improves, then you maybe need 7 hours of home care instead of 10 hours. (Subject 2, neuromuscular disease)

One participant indicated that he partly reimbursed his activity costs through the *national government*, by subtracting the costs of his activities from the income tax. Moreover, participants suggested that the *national government* should facilitate appropriate sports facilities. Both *national government* and *municipalities* were mentioned to subsidize sports clubs. Members of sports clubs mentioned that the sports clubs are financed by the donations from *sponsors*, often local companies. Lastly, participants indicated *health insurers* as being responsible for the finance of physical activity, since active people are more healthy, what saves health costs. According to the participants, *health insurers* pretend to stimulate active lifestyle, but should also partly finance physical activity. However, participants in this study stated it would be hard to get *health insurers* finance physical activity. Participants stated that partly financed physical activity is stimulating, because lack of finances cannot be an excuse for not being physically active.

And then they talk about: 'Yes, everybody should live more healthy', but the health care insurance does not do anything to stimulate that. (Subject 9, lower limb amputation)

## Discussion

This study aimed to explore ideas of the target population about a community-based intervention to stimulate physical activity in

hard-to-reach physically disabled people. According to the target population, an intervention should aim to raise awareness for the health effects of physical activity, stimulate intrinsic motivation, offer diverse activities, increase the visibility of the possible activities, and improve the image of physical activity for physically disabled people. In order to accomplish this, an intervention should include buddies, trial periods, individual conversations with a coach, and apply appropriate marketing and promotion. The target population can be reached through social media and intermediate organizations, and should be personally approached by health professionals or via word of mouth. Physical activity should be financed by the user, government, and health insurers.

Although this was not the primary focus of the current study, determinants of physical activity were reported by participants (Figure 1). These determinants confirmed existing literature on barriers and facilitators toward physical activity in physically disabled people [8,34–38]. Additionally, these determinants concurred with those mentioned by professional experts in our previous research [12]. However, participants emphasized more frequently individual level determinants, rather than environmental level determinants. For instance, they added relaxation and competition as individual level facilitators, and emphasized the positive effects of physical activity on health condition, where professionals did not report on effects of physical activity on health condition [12].

Regarding intervention methods (Figure 1), in spinal cord injury patients, the use of role models as an intervention method was also suggested [38]. Participants emphasized individual level intervention methods, where professionals emphasized environmental-level intervention methods [12]. Physically disabled people participating in the current study demanded an intervention to aim for increasing diversity and number of potential activities, which was not found in earlier research. In contrast, professionals indicated that the amount of potential activities was sufficient, but that potential activities should be made more visible [12]. Possibly, potential activities were not known by the target population and so they request more activities. Participants predominantly focused on the importance of intrinsic motivation, and methods to accomplish this, such as individual coaching and focus of the activity. In contrast, professionals only briefly mentioned intrinsic motivation as being important [12]. Professionals focused more on the use of existing interventions, and highlighted the importance of improved collaboration between organizations [12]. Participants strongly emphasized that the location should be not too far from their home, but the majority of the participants preferred group activities specifically for disabled people. This combination might not be possible in all areas. Moreover, participants mentioned that among others physicians are responsible to emphasize the importance of physical activity. However, the hard-to-reach population which is targeted by the intervention might not be in contact with a physician.

At the level of conditions (Figure 1), the target population indicated that only the person involved is responsible for his or her physical activity, whereas professionals designated several people or organizations as responsible to stimulate physical activity in this population. Inconsistent with the focus on self-responsibility, participants in the current study mentioned multiple parties that should finance physical activity, as municipalities and health insurers. Through the current study, social media groups for specific diagnoses were added as a method to identify the hard-to-reach target population. Together with intermediate organizations as patient organizations, as suggested by the target population, and organizations from social background and home care, as suggested by professionals [12], diagnose specific social media groups, could be a way to reach the hard-to-reach target population.



The interviews lasted 10–62 min. Although there are no strict guidelines for the duration of interviews, 10 min was extremely short, which could have affected the amount of data obtained [39,40]. In general, interviews performed at home lasted longer compared to interviews performed at sports locations. It is suggested that participants spoke more at ease in home situations. In five interviews, participants were assisted by family members, or a nurse. The presence of others during the interview might have affected the opinions expressed by the participants [39]. The current study focused on stimulating both daily physical activity and sports participation. Sports is defined as an activity involving physical exertion with or without a game or competition element with a minimal duration of 30 min for at least two times a week, where skills and physical endurance are either required or to be improved [41]. During the interviews, both terms are used. It could have been that participants focused either more on daily physical activity or more on sports stimulation, what could have limited the results. Interviewing people who are already active could possibly have introduced information bias, which could for instance explain the emphasis on self-responsibility for being physically active found in the current study.

Moreover, the current study is limited, since only people from the northern part of the Netherlands were invited to participate, due to practical reasons. This part is more sparsely populated than the west of the country, where less sports facilities are available, and at a further distance [42]. These differences could have influenced the transferability of the results to other parts of the country, and other countries. The authors suggest that determinants of physical activity and ideas on an intervention (Figure 1) as found in the current study are mostly general applicable for developed countries. However, conditions for an intervention (reach, finance, and responsibility) are suggested to depend on national approaches to promote physical activity in disabled people that differ between countries [43]. Conditions should, therefore, be considered within the specific country prior to implementation of an intervention.

A strength of the current study is the heterogeneous background of participants regarding age, gender, impairment, and physical activity participation. Hereby, it is attempted to investigate different perspectives on physical activity promotion. Because of the heterogeneous population, seven additional interviews were performed to ensure data saturation, but no new relevant information was obtained. A member check was performed after each interview, to increase the validity of the results. To increase reliability of the analyses, the first four transcripts were double coded, and coding was constantly discussed. The double coding and constant discussion during data analyses diminished interpretation bias, and thereby ensured reliability of the conclusions.

Future research should focus on the design of a community-based movement intervention for physically disabled people, based on the findings of current study and earlier research in professionals [12]. Testing the implementation process and effectiveness of the intervention is recommended in order to provide practical guidelines for the stimulation of physical activity in hard-to-reach physically disabled people.

## Conclusion

According to the target population, an intervention to stimulate physical activity in physically disabled people should aim to raise awareness for the health effects of physical activity, stimulate intrinsic motivation, offer diverse activities, increase the visibility of the possible activities, and improve the image of physical activity for physically disabled people. For instance, individual

coaching, role models, and marketing are suggested as intervention methods. Hard-to-reach physically disabled people can be identified by social media and several intermediate organizations, and can be approached, for instance, by word of mouth, websites, and marketing in order to stimulate them to become physically active to gain health benefits.

## Acknowledgements

The authors would like to thank the participants for sharing their opinions about this topic.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Funding

This study was funded by the University Medical Center Groningen, Department of Rehabilitation Medicine, Groningen, the Netherlands.

## ORCID

Leonie A. Krops  <http://orcid.org/0000-0003-1721-3953>

## References

- [1] World Health Organization. International classification of functioning, disability and health. 1st ed. Geneva (Switzerland): ICF; 2001.
- [2] Ekelund U, Steene-Johannessen J, Brown WJ, et al. Can physical activity eliminate the detrimental association of sitting time with mortality? A harmonized meta-analysis of data from more than one million men and women. *Lancet*. 2016;6736:1–10.
- [3] Caspersen CJ, Powell KE, Christenson GM. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public Health Rep*. 1985;100:126–131.
- [4] Heath GW, Fentem PH. Physical activity among persons with disabilities—a public health perspective. *Exerc Sport Sci Rev*. 1997;25:195–234.
- [5] Rimmer JH, Marques AC. Physical activity for people with disabilities. *Lancet*. 2012;380:193–195.
- [6] Van Den Berg-Emons RJ, Bussmann JB, Stam HJ. Accelerometry-based activity spectrum in persons with chronic physical conditions. *Arch Phys Med Rehabil*. 2010;91:1856–1861.
- [7] Rimmer JH, Braddock D, Pitetti KH. Research on physical activity and disability: an emerging national priority. *Med Sci Sports Exerc*. 1996;28:1366–1372.
- [8] Martin Ginis KA, Ma JK, Latimer-Cheung AE, et al. A systematic review of review articles addressing factors related to physical activity participation among children and adults with physical disabilities. *Health Psychol Rev*. 2016;7199:1–31.
- [9] van der Ploeg HP, van der Beek AJ, van der Woude LH, et al. Physical Activity for People with a Disability: a conceptual model. *Sports Med*. 2004;34:639–649.

- [10] De Vries H, Dijkstra M, Kuhlman P. Self-efficacy: the third factor besides attitude and subjective norm as a predictor of behavioural intentions. *Health Educ Res.* 1988;3:273–282.
- [11] Bartholomew LK, Parcel GS, Kok G, et al. Planning health promotion programs; an Intervention Mapping approach. San Francisco (CA): Jossey-Bass; 2011.
- [12] Krops LA, Hols DH, Folkertsma N, et al. Requirements on a community-based intervention for stimulating physical activity in physically disabled people: a focus group study amongst experts. *Disabil Rehabil.* 2017. DOI: [10.1080/09638288.2017.1336645](https://doi.org/10.1080/09638288.2017.1336645)
- [13] Rimmer JH, Chen MD, McCubbin JA, et al. Exercise intervention research on persons with disabilities: what we know and where we need to go. *Am J Phys Med Rehabil.* 2010;89:249–263.
- [14] Cervantes CM, Taylor WC. Physical activity interventions in adult populations with disabilities: a review. *Quest.* 2011;63:385–410.
- [15] Rosenberg DE, Bombardier CH, Hoffman JM, et al. Physical activity among persons aging with mobility disabilities: shaping a research agenda. *J Aging Res.* 2011;2011:1–16.
- [16] von Heijden A, van den Dool R, van Lindert C, et al. (On)bepoort sportief 2013. Monitor sport- en beweegdeelname van mensen met een handicap [(Un)limited exercise 2013. Monitoring sport- and exercise participation in handicapped people]. Utrecht (the Netherlands): Mulier Instituut/ Arko Sports Media; 2013. Dutch.
- [17] van der Ploeg HP, Streppel KRM, van der Beek AJ, et al. Successfully improving physical activity behavior after rehabilitation. *Am J Health Promot.* 2007;21:153–159.
- [18] Morris JH, Macgillivray S, McFarlane S. Interventions to promote long-term participation in physical activity after stroke: a systematic review of the literature. *Arch Phys Med Rehabil.* 2014;95:956–967.
- [19] Oliveira CB, Franco MR, Maher CG, et al. The efficacy of a multimodal physical activity intervention with supervised exercises, health coaching and an activity monitor on physical activity levels of patients with chronic, nonspecific low back pain (Physical Activity for Back Pain (PAYBACK) trial. *Trials* 2018;19:40.
- [20] Coultas DB, Jackson BE, Russo R, et al. Home-based physical activity coaching, physical activity, and healthcare utilization in COPD: COPD-SMART secondary outcomes. *Ann Am Thorac Soc.* 2018;15:470–478.
- [21] Nooijen CFJ, Stam HJ, Bergen MP, et al. A behavioural intervention increases physical activity in people with subacute spinal cord injury: a randomised trial. *J Physiother.* 2016;62:35–41.
- [22] Ang DC, Kaleth AS, Bigatti S, et al. Research to encourage exercise for fibromyalgia (REEF): use of motivational interviewing, outcomes from a randomized-controlled trial. *Clin J Pain.* 2013;29:296–304.
- [23] Plotnikoff RC, Costigan SA, Karunamuni ND, et al. Community-based physical activity interventions for treatment of type 2 diabetes: a systematic review with meta-analysis. *Front Endocrin.* 2013;4:3.
- [24] Alingh RA, Hoekstra F, van der Schans CP, et al. Protocol of a longitudinal cohort study on physical activity behaviour in physically disabled patients participating in a rehabilitation counselling programme: ReSpAct. *BMJ Open.* 2015;5:e007591.
- [25] Baker PR, Francis DP. Cochrane review: community-wide interventions for increasing physical activity. *J Evid Based Med.* 2015;8:57–58.
- [26] Hale LA, Smith C, Mulligan H, et al. “Tell me what you want, what you really really want . . .”: asking people with multiple sclerosis about enhancing their participation in physical activity. *Disabil Rehabil.* 2012;34:1887–1893.
- [27] Crowe S, Gillis C. Making patient relevant clinical research a reality. *BMJ.* 2016;23:i6627.
- [28] Bate P, Robert G. Experience-based design: from redesigning the system around the patient to co-designing services with the patient. *Qual Saf Health Care.* 2006;15:307–310.
- [29] Yardley L, Morrison L, Bradbury K, et al. The person-based approach to intervention development: application to digital health-related behavior change interventions. *J Med Internet Res.* 2015;17:e30.
- [30] Pope C, Mays N, Qualitative R. Reaching the parts other methods cannot reach: an introduction to qualitative methods in health and health services research. *BMJ.* 1995;311:42–45.
- [31] Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am J Public Health.* 1999;89:1322–1327.
- [32] Braun V, Clarke V. What can “thematic analysis” offer health and wellbeing researchers? *Int J Qual Stud Heal Well-Being.* 2014;9:26152.
- [33] Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psych.* 2006;3:77–101.
- [34] Jaarsma EA, Dekker R, Geertzen JHB, et al. Sports participation after rehabilitation: barriers and facilitators. *J Rehabil Med.* 2016;48:72–79.
- [35] Murphy NA, Carbone PS. Promoting the participation of children with disabilities in sports, recreation, and physical activities. *Pediatrics.* 2008;121:1057–1061.
- [36] Rimmer JH, Riley B, Wang E, et al. Physical activity participation among persons with disabilities: barriers and facilitators. *Am J Prev Med.* 2004;26:419–425.
- [37] Newitt R, Barnett F, Crowe M. Understanding factors that influence participation in physical activity among people with a neuromusculoskeletal condition: a review of qualitative studies. *Disabil Rehabil.* 2016;38:1–10.
- [38] Kerstin W, Gabriele B, Richard L. What promotes physical activity after spinal cord injury? An interview study from a patient perspective. *Disabil Rehabil.* 2006;28:481–488.
- [39] Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Heal Care.* 2007;19:349–357.
- [40] DiCicco-Bloom B, Crabtree BF. The qualitative research interview. *Med Educ.* 2006;40:314–321.
- [41] Kemper H, Ooijendijk W, Stiggelbout M. Consensus over de Nederlandse norm voor gezond bewegen [Consensus on the Dutch norm for healthy exercise]. *Tijdschr Voor Soc Gezondheidszorg.* 2000;78:180–183. Dutch.
- [42] Hoekman R, Hoenderkamp K, van der Poel H, et al. Sportaccommodaties in beeld [Sports accommodations in the picture]. Utrecht (the Netherlands): Mulier Instituut/ Arko Sports Media; 2013.
- [43] Hoekstra F, Roberts L, van Lindert C, et al. National approaches to promote sports and physical activity in adults with disabilities: examples from the Netherlands and Canada. *Disabil Rehabil.* 2018. DOI: [10.1080/09638288.2017.1423402](https://doi.org/10.1080/09638288.2017.1423402)